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ORIGINAL

FLOOD INSURANCE STUDY

COMPLETED
36

TOWN OF GRUNDY, VIRGINIA
BUCHANAN COUNTY

FEBRUARY 16, 1982

Federal Emergency Management Agency

COMMUNITY NUMBER - 510025

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PUBLISHED SEPARATELY:

Flood Insurance Rate Map

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FLOOD INSURANCE STUDY
TOWN OF GRUNDY, VIRGINIA

1.0 INTRODUCTION

1.1 Purpose of Study

This Flood Insurance Study investigates the existence and severity of flood hazards in the Town of Grundy, Buchanan County, Virginia, and aids in the administration of the National Flood Insurance Act of 1968 and the Flood Disaster Protection Act of 1973. This study will be used to convert Grundy to the regular program of flood insurance by the Federal Emergency Management Agency (FEMA). Local and regional planners will use this study in their efforts to promote sound flood plain management.

In some states or communities, flood plain management criteria or regulations may exist that are more restrictive or comprehensive than those on which these federally-supported studies are based. These criteria take precedence over the minimum federal criteria for purposes of regulating development in the flood plain, as set forth in the Code of Federal Regulations at 44 CFR, 60.3. In such cases, however, it shall be understood that the state (or other jurisdictional agency) shall be able to explain these requirements and criteria.

1.2 Authority and Acknowledgements

The source of authority for this Flood Insurance Study is the National Flood Insurance Act of 1968 and the Flood Disaster Protection Act of 1973.

The hydrologic and hydraulic analyses for this study were prepared by the Huntington District of the U. S. Army Corps of Engineers for the Federal Emergency Management Agency, under Inter-Agency Agreement No. IAA-H-10-77, Project Order No. 29. This work was completed in January 1981.

1.3 Coordination

On October 5, 1976, an initial Consultation and Coordination Officer's (CCO) meeting was held with representatives of the FEMA, the Town of Grundy, and the U. S. Army Corps of Engineers (COE - the study contractor). The purpose of the meeting was to explain the nature and purpose of the study, to identify the study streams, to establish the study limits, and to discuss the methodology to be used and the concept of a floodway. During the course of the study, the Virginia Department of Highways and the Town Board of Grundy were contacted for information.

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On October, 15, 1981, the results of the study were reviewed at a final CCO meeting attended by representatives of the FEMA, the town, and the COE.

2.0 AREA STUDIED

2.1 Scope of Study

This Flood Insurance Study covers the incorporated area of the Town of Grundy, Buchanan County, Virginia. The area of study is shown on the Vicinity Map (Figure 1).

The entire lengths of Levisa Fork and Slate Creek within the corporate limits were studied by detailed methods. The areas studied by detailed methods were selected with priority given to all known flood hazard areas and areas of projected development and proposed construction for the next five years, through January 1986.

Portions of Three and Twentymile Branch, Newhouse Branch, Watkins Branch, and Dave Branch were studied by approximate methods. Approximate methods of analysis were used to study those areas having low development potential and minimal flood hazards as identified at the initiation of the study. The scope and methods of study were proposed to and agreed upon by the FEMA.

2.2 Community Description

The Town of Grundy is located in the west-central portion of Buchanan County in southwestern Virginia, approximately 17 miles east of Elkhorn City, Kentucky, and approximately 48 miles west of Welch, West Virginia. It is situated at the junction of Slate Creek and Levisa Fork. Grundy is surrounded by unincorporated areas of Buchanan County.

Buchanan County is in the Kanawha section of the Appalachian Plateau physiographic province. It is part of the richest coal producing area in the United States, with mining operations practically sustaining the entire economy.

Although termed a plateau, the area is extremely rugged, as the plateau surface has been intricately dissected by stream erosion. The streams form a random dendritic pattern with steeply sloped valleys and narrow crested ridges. Local relief ranges from 1,000 to 2,000 feet.

Housing patterns, roads, and rail lines follow the streams, since construction elsewhere is generally infeasible. Because of the narrowness of the valley bottoms, rail lines follow one side of the bank

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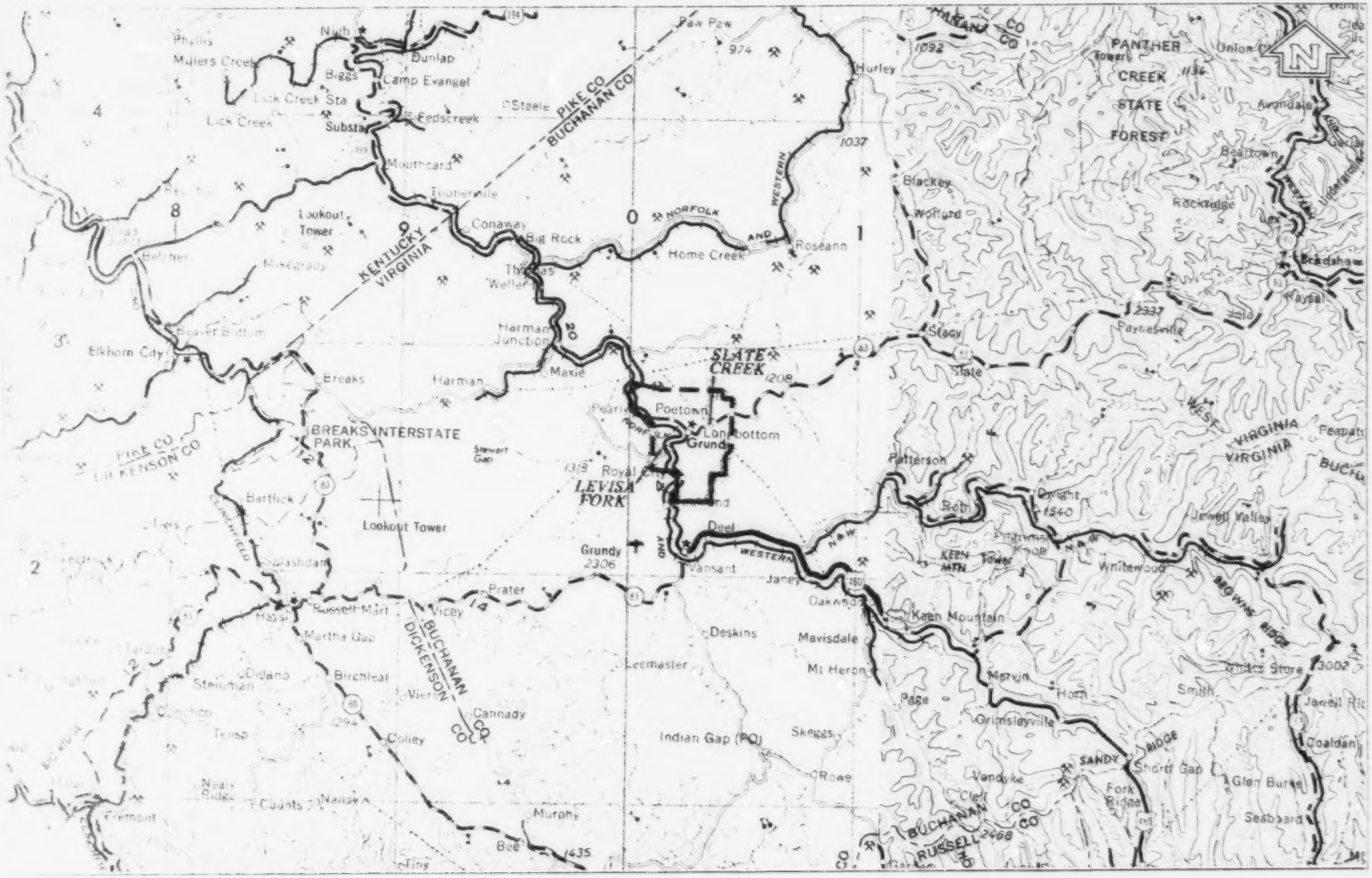

FIGURE 1

FEDERAL EMERGENCY MANAGEMENT AGENCY

TOWN OF GRUNDY, VA
(BUCHANAN CO.)

APPROXIMATE SCALE

4 0 4 8 12 MILES

VICINITY MAP

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of the stream and the highway or roadway follows the other side. Except for an occasional logging road or jeep trail, only a few roads emerge from the narrow valleys to cross a divide from the headwaters of one stream to the headwaters of another.

The county consists mainly of coal mining properties. About 87 percent of the land is forested and only 8 percent is farmland. Industrial development is slight (Reference 1).

The Grundy area is served by the Buchanan branch of the Norfolk and Western Railway, which was built to open the county's coal resources for mining and shipment in the early 1900s. Several sub-branches of this railroad follow tributaries to Levisa Fork, one extending down Levisa Fork into Pike County, Kentucky, while others follow tributaries to various parts of Buchanan County.

The county is traversed by U. S. Highway 460, which, through most of the county, follows Levisa Fork. South of Grundy, U. S. Highway 460 has been reconstructed as a modern divided highway.

The Grundy area, including adjacent valley slopes, occupies approximately six percent of Buchanan County's 508 square miles. As a result of its proximity to road and rail transportation and the developed resources of the county, Grundy accounts for a large portion of the total county population.

Grundy was established in 1858 as the county seat of Buchanan County. The population of the town was 2,054 in 1970 (Reference 2). The July 1976 population was estimated at 1,891, indicating an eight percent decrease since 1970 (Reference 3).

The annual precipitation ranges between 45 and 50 inches. Because of the mountainous terrain, there is a wide variation in rainfall during storms.

2.3 Principal Flood Problems

Approximately 75 percent of the flooding in Grundy occurs between December and March. Major streams in the area usually experience an annual spring flood. Smaller streams tend to flood after each intense thunderstorm throughout the year.

Grundy has a history of severe flooding problems from Slate Creek and Levisa Fork. Damage from floods has had a tremendous effect on the economy of the area. Approximately 90 percent of the structures in the town lie in a flood hazard area. Eight major floods have occurred since 1929, with the April 1977 flood being the flood of record.

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The 1977 flood exceeded the previous maximum flooding level of the 1957 flood by about three feet. Three lives were lost and the estimated damage in the Grundy area was in the millions of dollars. The main downtown commercial area was inundated to a depth of approximately six feet. All local utilities were shut down due to excessive flood damage. The force of the water tore away store fronts, washed away several buildings, and completely destroyed several mobile home parks. In the downtown commercial area of Grundy, silt up to two feet deep and debris as much as five feet in depth piled around poles and corners of buildings. The 1977 flood at Grundy is estimated to have had a recurrence interval of slightly more than 100 years. In addition to those floods of 1957 and 1977, major floods occurred in 1929, 1946, 1958, 1963, 1967, and 1978.

Figures 2, 3, and 4 show the destruction that was caused by the April 1977 flood in the Grundy area.

2.4 Flood Protection Measures

The Town of Grundy has no existing or proposed local flood protection measures. No projects are planned for construction in the Levisa Fork basin that would reduce flooding in the Grundy area. Upstream of Grundy and along a portion of U. S. Highway 460, the channel of Levisa Fork has been enlarged and some channel banks have been lined with concrete. These modifications were made in conjunction with the recent upgrading of the highway.

Several years ago, local interests cleaned and enlarged the Levisa Fork channel through Grundy. This improvement provides some degree of protection from minor floods, however, regular maintenance must be provided to maintain its primary function for flood height reductions.

3.0 ENGINEERING METHODS

For the flooding sources studied in detail in the community, standard hydrologic and hydraulic study methods were used to determine the flood hazard data for this study. Flood events of a magnitude which are expected to be equalled or exceeded once on the average during any 10-, 50-, 100-, or 500-year period (recurrence interval) have been selected as having special significance for flood plain management and for flood insurance premium rates. These events, commonly termed the 10-, 50-, 100-, and 500-year floods, have a 10-, 2-, 1-, and 0.2-percent chance, respectively, of being equalled or exceeded during any year. Although the recurrence interval represents the long-term average period between floods of a specific magnitude, rare floods could occur at short intervals or even within the same year. The risk of experiencing a rare flood increases when periods greater than one year are considered. For example, the risk of having a flood which equals or exceeds

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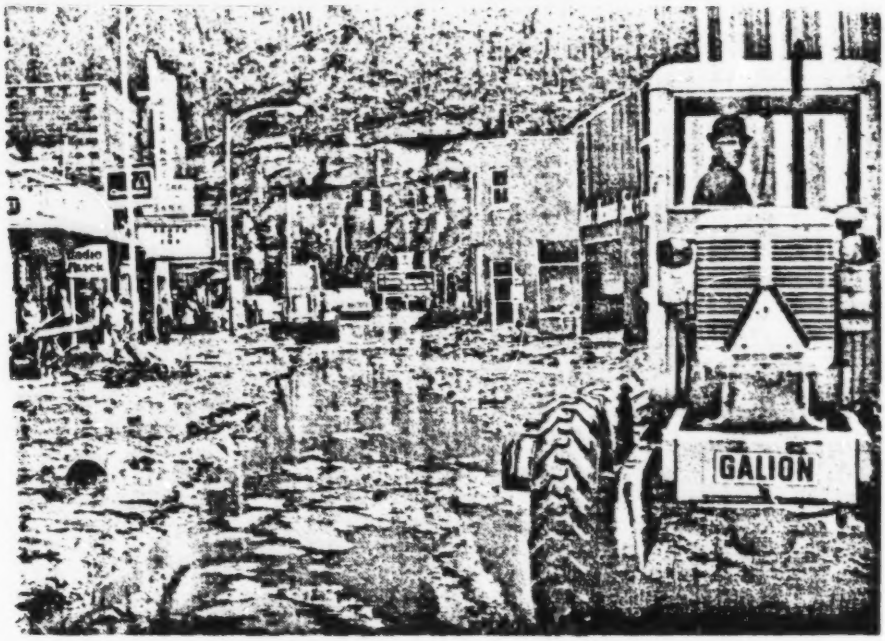

Figure 2 - Flood damage from Levisa Fork and Slate Creek at Main Street in Grundy, following the April 1977 flood.

Figure 3 - Flood damage at the Rexall Drug Store in downtown Grundy, following the April 1977 flood.

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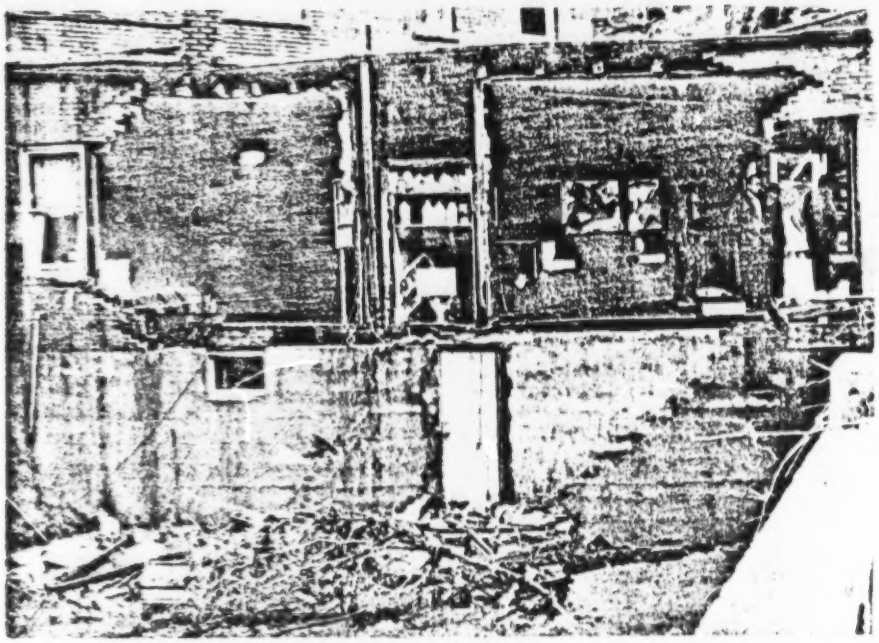

Figure 4 - Flood damage in downtown Grundy at the end of Slate Creek, following the April 1977 flood.

the 100-year flood (one-percent chance of annual occurrence) in any 50-year period is about 40 percent (four in ten) and, for any 90-year period, the risk increases to about 60 percent (six in ten). The analyses reported here reflect flooding potentials based on conditions existing in the community at the time of completion of this study. Maps and flood elevations will be amended periodically to reflect future changes.

3.1 Hydrologic Analyses

Hydrologic analyses were carried out to establish the peak discharge-frequency relationships for floods of the selected recurrence intervals for each flooding source studied in detail affecting the community.

Natural discharge-frequency curves for Levisa Fork and Slate Creek were taken from the Flood Plain Information report for Grundy (Reference 1). These data were updated and reanalyzed to conform to present FEMA guidelines. The curves are based on a regional analysis in accordance with the method outlined by Leo R. Beard and the Water Resources Council Bulletin No. 17 (References 4 and 5).

Records of past floods and streamflow measurements used in this study were obtained from the U. S. Geological Survey (USGS) gage located at river mile 140.6 on Levisa Fork upstream of Big Rock. However, this gage

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was discontinued in September 1974, and a new gage is being established near Big Rock at approximately river mile 132.6 on Levisa Fork. Records kept since 1940 from the discontinued gage are available.

Twenty USGS stream gaging stations in the surrounding drainage basins displaying similar hydrologic characteristics were used in the regional analysis. Periods of record range from 16 to 60 years and represent drainage areas of 31 to 3,892 square miles. A period of record of 60 years was adopted as being representative and was used in computing the estimated frequency for each evaluation center.

A summary of drainage area-peak discharge relationships for Levisa Fork and Slate Creek is shown in Table 1, "Summary of Discharges".

TABLE 1 - SUMMARY OF DISCHARGES

FLOODING SOURCE AND LOCATION	DRAINAGE AREA (sq. miles)	PEAK DISCHARGES (cfs) 10-YEAR	50-YEAR	100-YEAR	500-YEAR
LEVISA FORK					
At the downstream corporate limits	233.6	24,500	41,700	50,600	75,300
Upstream of the confluence of Slate Creek	192.2	20,040	34,110	41,380	61,590
SLATE CREEK					
At the confluence with Levisa Fork	40.5	7,900	13,900	17,000	26,000

3.2 Hydraulic Analyses

Analyses of the hydraulic characteristics of the flooding sources studied in detail were carried out to provide estimates of the elevations of floods of the selected recurrence intervals along each of these flooding sources.

Cross sections for the backwater analyses were obtained from aerial photographs flown in April 1978 (Reference 6). The below-water sections were obtained from field measurement. All bridges were field checked to obtain elevation data and structural geometry. Cross sections were located at close intervals immediately upstream and downstream of all bridges.

Channel roughness factors (Manning's "n") used in the hydraulic computations were chosen by engineering judgment and based on field observations of the streams and flood plain areas. Roughness "n" values

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for for Levisa Fork channel and overbank areas ranged from 0.045 to 0.075. The channel "n" values for Slate Creek ranged from 0.045 to 0.060, and the overbank "n" values ranged from 0.045 to 0.075.

Water-surface elevations of floods of the selected recurrence intervals were computed through the use of the COE HEC-2 step-backwater computer program (Reference 7). Starting water-surface elevations for Levisa Fork were calculated using the slope/area method. Starting water-surface elevations for Slate Creek were determined using the corresponding coincident flood crests on Levisa Fork.

Flood profiles were drawn showing computed water-surface elevations to an accuracy of 0.5 foot for floods of the selected recurrence intervals. Locations of selected cross sections used in the hydraulic analyses are shown on the Flood Profiles (Exhibit 1). For stream segments for which a floodway is computed (Section 4.2), selected cross-section locations are also shown on the Flood Boundary and Floodway Map (Exhibit 2).

All elevations used in this study are referenced to the National Geodetic Vertical Datum of 1929 (NGVD), formerly referred to as Sea Level Datum of 1929. Locations of the elevation reference marks used in the study are shown on the maps.

The hydraulic analyses for this study are based on the effects of unobstructed flow. The flood elevations shown on the profiles are valid only if hydraulic structures remain unobstructed and do not fail.

For the areas studied by approximate methods, the 100-year flood elevations were developed from normal depth calculations and on-site inspections. The developed 100-year profile was plotted against the stream bottom profile. Average depths were determined along the study reaches. During an on-site inspection, these depths were equated to the actual stream channel and inundation limits were established.

4.0 FLOOD PLAIN MANAGEMENT APPLICATIONS

The National Flood Insurance Program encourages state and local governments to adopt sound flood plain management programs. Therefore, each Flood Insurance Study includes a flood boundary map designed to assist communities in developing sound flood plain management measures.

4.1 Flood Boundaries

In order to provide a national standard without regional discrimination, the 100-year flood has been adopted by the FEMA as the base flood for purposes of flood plain management measures. The 500-year flood is employed to indicate additional areas of flood risk in the community. For each

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stream studied in detail, the boundaries of the 100- and 500-year floods have been delineated using the flood elevations determined at each cross section; between cross sections, the boundaries were interpolated using topographic maps at a scale of 1:2,400, enlarged from a scale of 1:24,000, with a contour interval of 40 feet (Reference 8). In cases where the 100- and 500-year flood boundaries are close together, only the 100-year boundary has been shown.

For the areas studied by approximate methods, the boundary of the 100-year flood was delineated using the topographic maps referenced above.

The boundaries of the 100- and 500-year floods are shown on the Flood Boundary and Floodway Map (Exhibit 2). Small areas within the flood boundaries may lie above the flood elevations and, therefore, may not be subject to flooding. Owing to limitations of the map scale and lack of detailed topographic data, such areas are not shown.

4.2 Floodways

Encroachment on flood plains, such as artificial fill, reduces the flood-carrying capacity, increases the flood heights of streams, and increases flood hazards in areas beyond the encroachment itself. One aspect of flood plain management involves balancing the economic gain from flood plain development against the resulting increase in flood hazard. For purposes of the Flood Insurance Program, the concept of a floodway is used as a tool to assist local communities in this aspect of flood plain management. Under this concept, the area of the 100-year flood is divided into a floodway and a floodway fringe. The floodway is the channel of a stream plus any adjacent flood plain areas that must be kept free of encroachment in order that the 100-year flood can be carried without substantial increases in flood heights. Minimum standards of the FEMA limit such increases in flood heights to 1.0 foot, provided that hazardous velocities are not produced. The floodways in this report are presented to local agencies as minimum standards that can be adopted or that can be used as a basis for additional studies.

The floodways presented in this study were computed on the basis of equal conveyance reduction from each side of the flood plains. The results of these computations are tabulated at selected cross sections for each stream segment for which a floodway is computed (Table 2).

As shown on the Flood Boundary and Floodway Map (Exhibit 2), the floodway widths were determined at cross sections; between cross sections, the boundaries were interpolated. In cases where the boundaries of the floodway and the 100-year flood are either close together or collinear, only the floodway boundary has been shown. Portions of the floodway widths for Levisa Fork extend beyond the corporate limits.

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FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE[1]	WIDTH (FT.)	SECTION AREA (SQ. FT.)	MEAN VELOCITY (F.P.S.)	REGULATORY (NGVD)	WITHOUT FLOODWAY (NGVD)	WITH FLOODWAY (NGVD)	INCREASE (FEET)
Levisa Fork								
A	141.280	182/80[2]	3,825	13.2	1,025.0	1,025.0	1,025.9	0.9
B	141.536	161/105[2]	3,549	14.3	1,029.5	1,029.5	1,030.2	0.7
C	141.799	161/50[2]	3,749	13.5	1,033.5	1,033.5	1,034.4	0.9
D	142.078	206/130[2]	3,748	13.5	1,038.4	1,038.4	1,039.0	0.6
E	142.361	208	4,235	11.9	1,045.7	1,045.7	1,046.4	0.7
F	142.583	232	6,120	8.3	1,048.6	1,048.6	1,049.4	0.8
G	142.742	189	4,191	12.1	1,048.6	1,048.6	1,049.5	0.9
H	142.965	178	4,537	11.2	1,051.9	1,051.9	1,052.7	0.8
I	143.151	299	5,582	9.1	1,053.8	1,053.8	1,054.7	0.9
J	143.325	289	4,604	9.0	1,056.1	1,056.1	1,056.7	0.6
K	143.479	214	3,498	11.8	1,056.6	1,056.6	1,057.2	0.6
L	143.624	184	3,550	11.7	1,058.4	1,058.4	1,059.2	0.8
M	143.731	291	3,597	11.5	1,059.6	1,059.6	1,060.4	0.8
N	143.886	241	2,782	14.9	1,062.2	1,062.2	1,062.8	0.6
O	144.011	315	5,072	8.2	1,067.5	1,067.5	1,068.3	0.8
P	144.130	180	3,889	10.6	1,068.1	1,068.1	1,068.8	0.7
Q	144.282	363	6,588	6.3	1,070.3	1,070.3	1,071.0	0.7
R	144.467	255	4,345	9.5	1,070.8	1,070.8	1,071.5	0.7
S	144.591	214	3,144	13.2	1,071.6	1,071.6	1,072.2	0.6

[1]Miles above confluence with Big Sandy River
[2]Width/width within corporate limits

TABLE 2

FEDERAL EMERGENCY MANAGEMENT AGENCY

TOWN OF GRUNDY, VA
(BUCHANAN CO.)

FLOODWAY DATA

LEVISA FORK

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FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE	WIDTH (FT.)	SECTION AREA (SQ. FT.)	MEAN VELOCITY (F.P.S.)	REGULATORY (NGVD)	WITHOUT FLOODWAY (NGVD)	WITH FLOODWAY (NGVD)	INCREASE (FEET)
Levisa Fork (continued)								
T	144.780[1]	169/135[3]	3,323	12.5	1,075.6	1,075.6	1,076.5	0.9
U	144.860[1]	190	4,450	9.3	1,078.0	1,078.0	1,078.9	0.9
V	144.969[1]	391	6,516	6.4	1,079.3	1,079.3	1,080.2	0.9
W	145.081[1]	462	5,843	7.1	1,079.7	1,079.7	1,080.6	0.9
X	145.280[1]	130	2,531	16.4	1,079.8	1,079.8	1,080.7	0.9
Slate Creek								
A	0.109[2]	510	1,637	10.4	1,054.3	1,050.2[4]	1,050.2[4]	0.0
B	0.177[2]	350	2,226	7.6	1,054.9	1,052.4[4]	1,052.4[4]	0.0
C	0.268[2]	250	1,476	11.5	1,058.5	1,058.5	1,058.6	0.1
D	0.335[2]	309	2,408	7.1	1,062.0	1,062.0	1,062.6	0.6
E	0.444[2]	183	1,730	9.8	1,067.7	1,067.7	1,068.6	0.9
F	0.610[2]	319	2,428	7.0	1,075.9	1,075.9	1,076.6	0.7
G	0.742[2]	109	1,288	13.2	1,082.2	1,082.2	1,083.2	1.0
H	0.857[2]	152	1,080	15.7	1,086.6	1,086.6	1,086.8	0.2
I	1.000[2]	265	2,572	6.6	1,092.7	1,092.7	1,093.5	0.8
J	1.161[2]	152	1,982	8.6	1,094.6	1,094.6	1,095.3	0.7

[1]Miles above confluence with Big Sandy River
[2]Miles above confluence with Levisa Fork
[3]Width/width within corporate limits
[4]Elevation computed without consideration of coincident peak flow from Levisa Fork

TABLE 2

FEDERAL EMERGENCY MANAGEMENT AGENCY

TOWN OF GRUNDY, VA
(BUCHANAN CO.)

FLOODWAY DATA

LEVISA FORK AND SLATE CREEK

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FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE[1]	WIDTH (FT.)	SECTION AREA (SQ. FT.)	MEAN VELOCITY (F.P.S.)	REGULATORY (NGVD)	WITHOUT FLOODWAY (NGVD)	WITH FLOODWAY (NGVD)	INCREASE (FEET)
Slate Creek (continued)								
K	1.289	166	1,498	11.3	1,096.7	1,096.7	1,097.2	0.5
L	1.417	88	977	17.4	1,101.2	1,101.2	1,101.6	0.4

[1]Miles above confluence with Levisa Fork

TABLE 2

FEDERAL EMERGENCY MANAGEMENT AGENCY

TOWN OF GRUNDY, VA
(BUCHANAN CO.)

FLOODWAY DATA

SLATE CREEK

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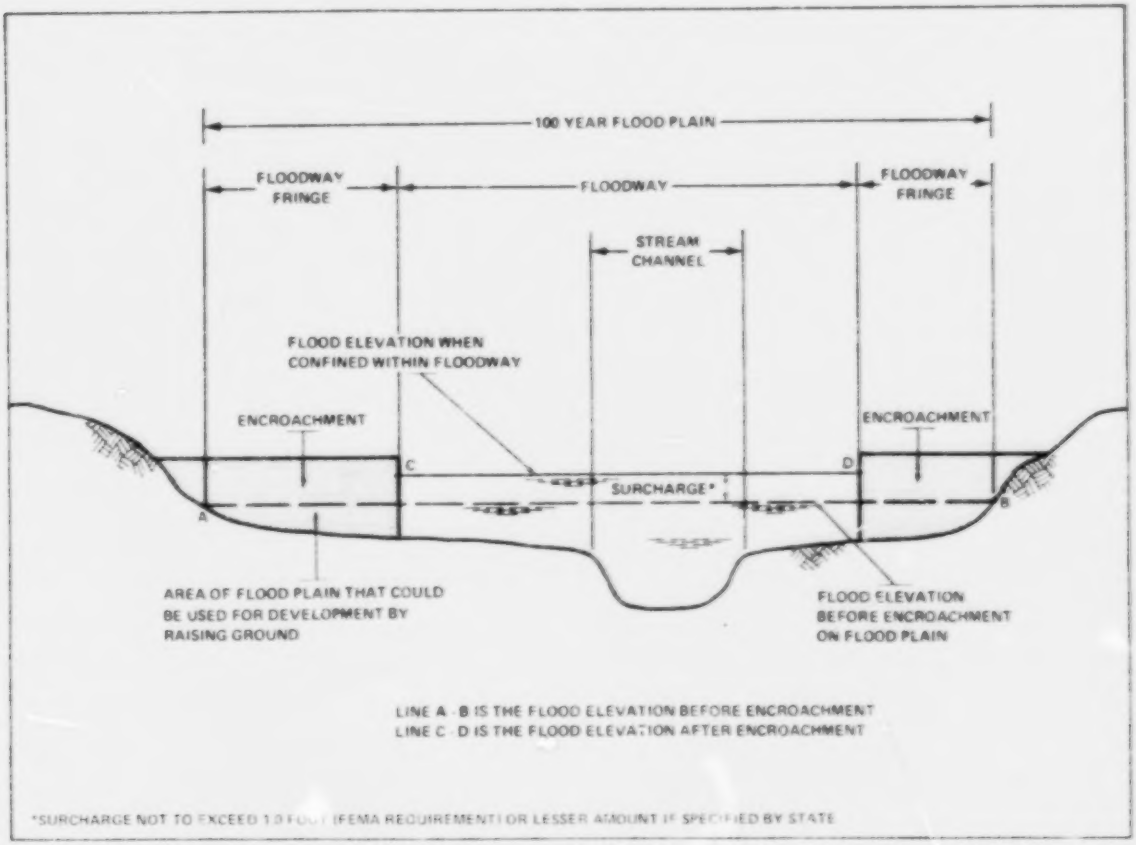
The area between the floodway and the boundary of the 100-year flood is termed the floodway fringe. The floodway fringe thus encompasses the portion of the flood plain that could be completely obstructed without increasing the water-surface elevation of the 100-year flood by more than 1.0 foot at any point. Typical relationships between the floodway and the floodway fringe and their significance to flood plain development are shown in Figure 5.


100 YEAR FLOOD PLAIN
FLOODWAY FRINGE
FLOODWAY
FLOODWAY FRINGE
STREAM CHANNEL
FLOOD ELEVATION WHEN CONFINED WITHIN FLOODWAY
ENCROACHMENT
ENCROACHMENT
C
D
SURCHARGE*
A
B
AREA OF FLOOD PLAIN THAT COULD BE USED FOR DEVELOPMENT BY RAISING GROUND
FLOOD ELEVATION BEFORE ENCROACHMENT ON FLOOD PLAIN
LINE A - B IS THE FLOOD ELEVATION BEFORE ENCROACHMENT
LINE C - D IS THE FLOOD ELEVATION AFTER ENCROACHMENT
*SURCHARGE NOT TO EXCEED 1.0 FOOT (FEMA REQUIREMENT) OR LESSER AMOUNT IF SPECIFIED BY STATE

FLOODWAY SCHEMATIC

Figure 5

Floodwaters from Levisa Fork and Slate Creek were found to have hazardous velocities. Encroachment into areas subject to inundation by these waters having hazardous velocities aggravates the risk of flood damage, and heightens potential flood hazards by further increasing velocities. To provide guidance for encroachment into these areas, a proposed floodway is delineated for that part of the 100-year flood plain that

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5.0 INSURANCE APPLICATION

In order to establish actuarial insurance rates, the FEMA has developed a process to transform the data from the engineering study into flood insurance criteria. This process includes the determination of reaches, Flood Hazard Factors (FHFs), and flood insurance zone designations for each flooding source affecting the Town of Grundy.

5.1 Reach Determinations

Reaches are defined as lengths of watercourses having relatively the same flood hazard, based on the average weighted difference in water-surface elevations between the 10- and 100-year floods. This difference does not have a variation greater than that indicated in the following table for more than 20 percent of the reach.

Average Difference Between 10- and 100-Year Floods	Variation
Less than 2 feet	0.5 foot
2 to 7 feet	1.0 foot
7.1 to 12 feet	2.0 feet
More than 12 feet	3.0 feet

The locations of the reaches determined for the flooding sources of the Town of Grundy are shown on the Flood Profiles (Exhibit 1) and are summarized in the Flood Insurance Zone Data Table (Table 3).

5.2 Flood Hazard Factors

The FHF is the FEMA device used to correlate flood information with insurance rate tables. Correlations between property damage from floods and their FHFs are used to set actuarial insurance premium rate tables based on FHFs from 005 to 200.

The FHF for a reach is the average weighted difference between the 10- and 100-year flood water-surface elevations expressed to the nearest 0.5 foot, and shown as a three-digit code. For example, if the difference between water-surface elevations of the 10- and 100-year floods is 0.7 foot, the FHF is 005; if the difference is 1.4 feet, the FHF is 015; if the difference is 5.0 feet, the FHF is 050. When the difference between the 10- and 100-year water-surface elevations is greater than 10.0 feet, accuracy for the FHF is to the nearest foot.

5.3 Flood Insurance Zones

After the determination of reaches and their respective FHFs, the entire incorporated area of the Town of Grundy was divided into zones, each

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FLOODING SOURCE	PANEL[1]	ELEVATION DIFFERENCE[2] BETWEEN 1.0% (100-YEAR) FLOOD AND			FHF	ZONE	BASE FLOOD ELEVATION[3] (NGVD)
		10% (10 YR.)	2% (50 YR.)	0.2% (500 YR.)			
Levisa Fork							
Reach 1	01	-7.8	-2.2	+5.0	080	A16	Varies
Slate Creek							
Reach 1	01	-7.8	-2.2	+5.0	080	A16	Varies
Reach 2	01	-7.1	-2.6	+6.1	070	A14	Varies
Reach 3	01	-4.6	-1.0	+2.4	045	A9	Varies
Reach 4	01	-3.9	-1.2	+3.0	040	A8	Varies
Reach 5	01	-5.1	-1.7	+3.2	050	A10	Varies

[1]Flood Insurance Rate Map Panel
[2]Weighted Average
[3]Rounded to the nearest foot - see map

TABLE 3

FEDERAL EMERGENCY MANAGEMENT AGENCY

TOWN OF GRUNDY, VA
(BUCHANAN CO.)

FLOOD INSURANCE ZONE DATA

LEVISA FORK AND SLATE CREEK

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having a specific flood potential or hazard. Each zone was assigned one of the following flood insurance zone designations:

Zone A:	Special Flood Hazard Areas inundated by the 100-year flood, determined by approximate methods; no base flood elevations shown or FHFs determined.
Zones A8, A9, A10, A14, and A16:	Special Flood Hazard Areas inundated by the 100-year flood, determined by detailed methods; base flood elevations shown, and zones subdivided according to FHF.
Zone B:	Areas between the Special Flood Hazard Area and the limits of the 500-year flood, including areas of the 500-year flood plain that are protected from the 100-year flood by dike, levee, or other water control structure; also, areas subject to certain types of 100-year shallow flooding where depths are less than 1.0 foot; and areas subject to 100-year flooding from sources with drainage areas less than 1 square mile. Zone B is not subdivided.
Zone C:	Areas of minimal flooding.

Table 3, "Flood Insurance Zone Data," summarizes the flood elevation differences, FHFs, flood insurance zones, and base flood elevations for the flooding sources studied in detail in the Town of Grundy.

5.4 Flood Insurance Rate Map Description

The Flood Insurance Rate Map for the Town of Grundy is, for insurance purposes, the principal result of the Flood Insurance Study. This map (published separately) contains the official delineation of flood insurance zones and base flood elevation lines. Base flood elevation lines show the locations of the expected whole-foot water-surface elevations of the base (100-year) flood. This map is developed in accordance with the latest flood insurance map preparation guidelines published by the FEMA.

6.0 OTHER STUDIES

In January 1971, the COE published a Flood Plain Information report for Levisa Fork and its tributaries (Reference 1). This report presented profiles of the 100-year flood and the March 1963 flood along Levisa Fork and Slate Creek through Grundy. The 100-year profile for Levisa Fork as shown in the report is in agreement in most reaches with the profile contained in this study. It, however, does vary a few feet in the downtown Grundy area. This variance resulted from increased discharges for the 100-year flood due to updated

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frequency determinations. Changes in channel conditions and modifications to the HEC-2 computer program also caused the two profiles to differ. The 100-year profile for Slate Creek in the Flood Plain Information report is two to three feet higher in several locations than the profile shown in this study. Channel and bridge modifications along the stream account for the lower profile in this study. Also, changes made in the HEC-2 program during the period between the two studies resulted in some reductions to the profile in this study. The Flood Hazard Boundary Map for the Town of Grundy has been published (Reference 9).

This study is authoritative for purposes of the Flood Insurance Program, and the data presented here either supersede or are compatible with previous determinations.

7.0 LOCATION OF DATA

Survey, hydrologic, hydraulic, and other pertinent data used in this study can be obtained by contacting the office of the Insurance and Mitigation Division of the Federal Emergency Management Agency, Regional Director, Region III Office, Curtis Building, Room 700, Sixth and Walnut Streets, Philadelphia, Pennsylvania 19106.

8.0 BIBLIOGRAPHY AND REFERENCES

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*U.S. GOVERNMENT PRINTING OFFICE: 1982-0-361-772/4090

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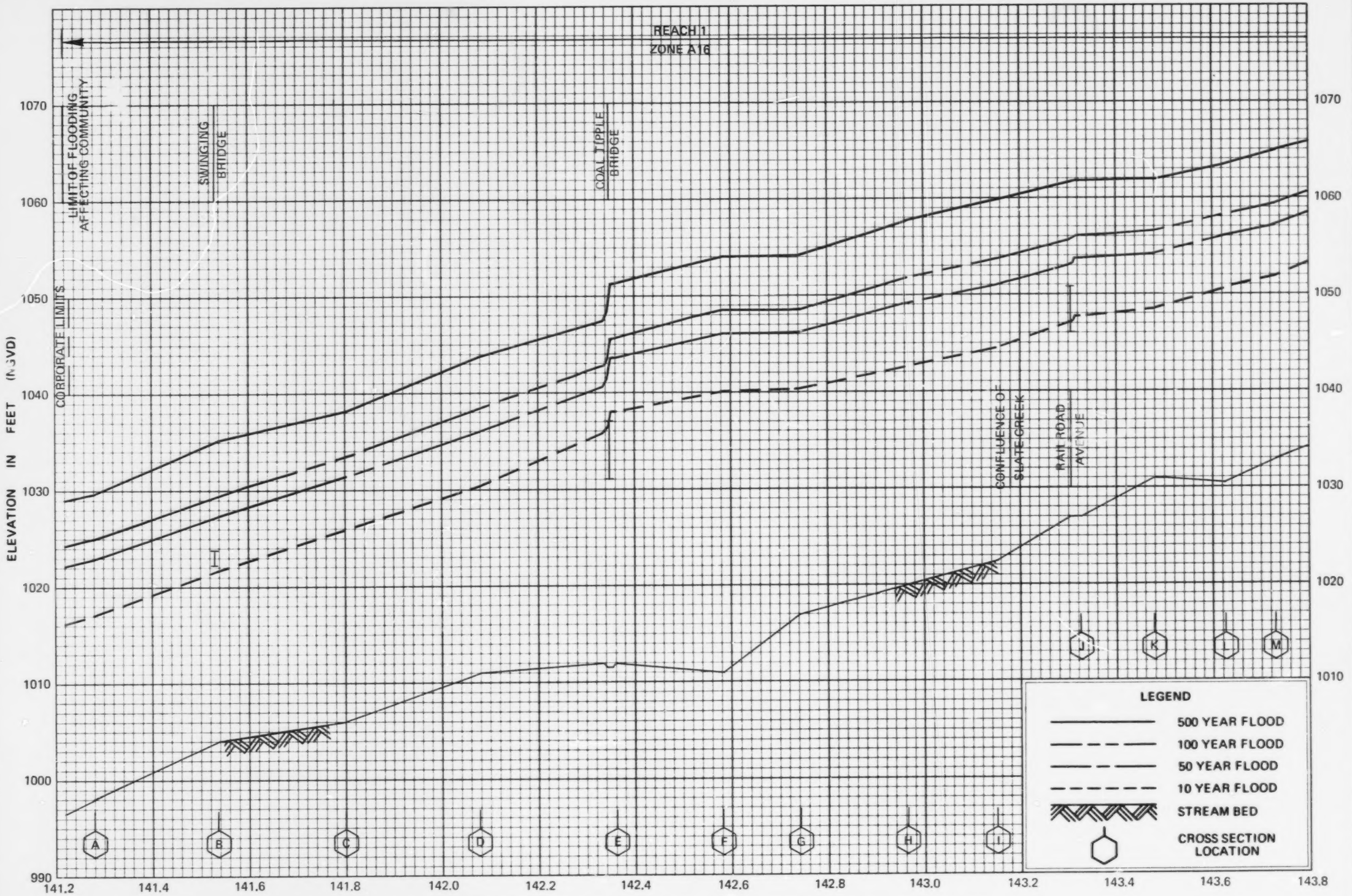

FLOOD PROFILES

LEVISA FORK

FEDERAL EMERGENCY MANAGEMENT AGENCY

TOWN OF GRUNDY, VA
(BUCHANAN CO.)

01P

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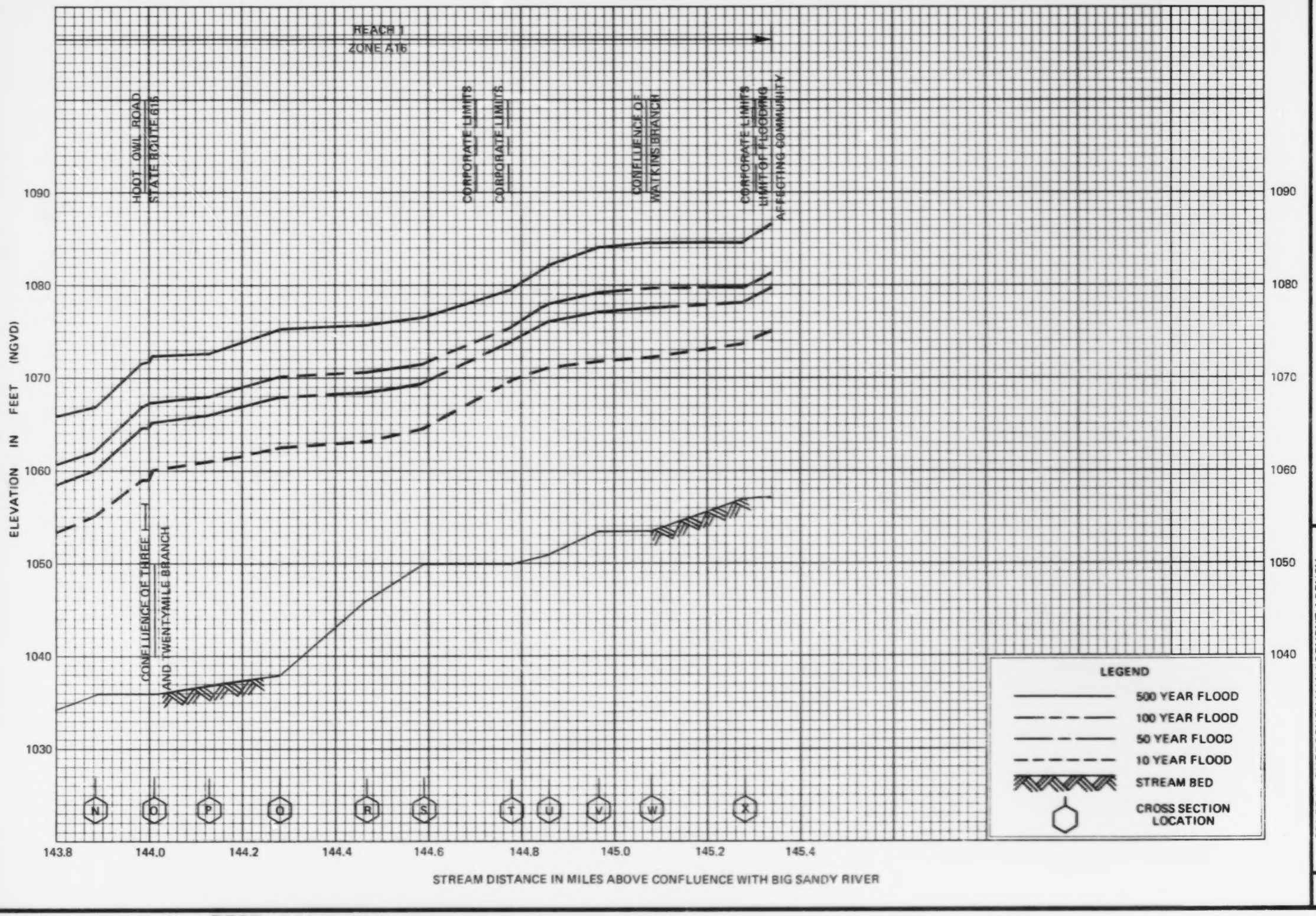

FLOOD PROFILES

LEVISA FORK

FEDERAL EMERGENCY MANAGEMENT AGENCY

TOWN OF GRUNDY, VA
(BUCHANAN CO.)

02P

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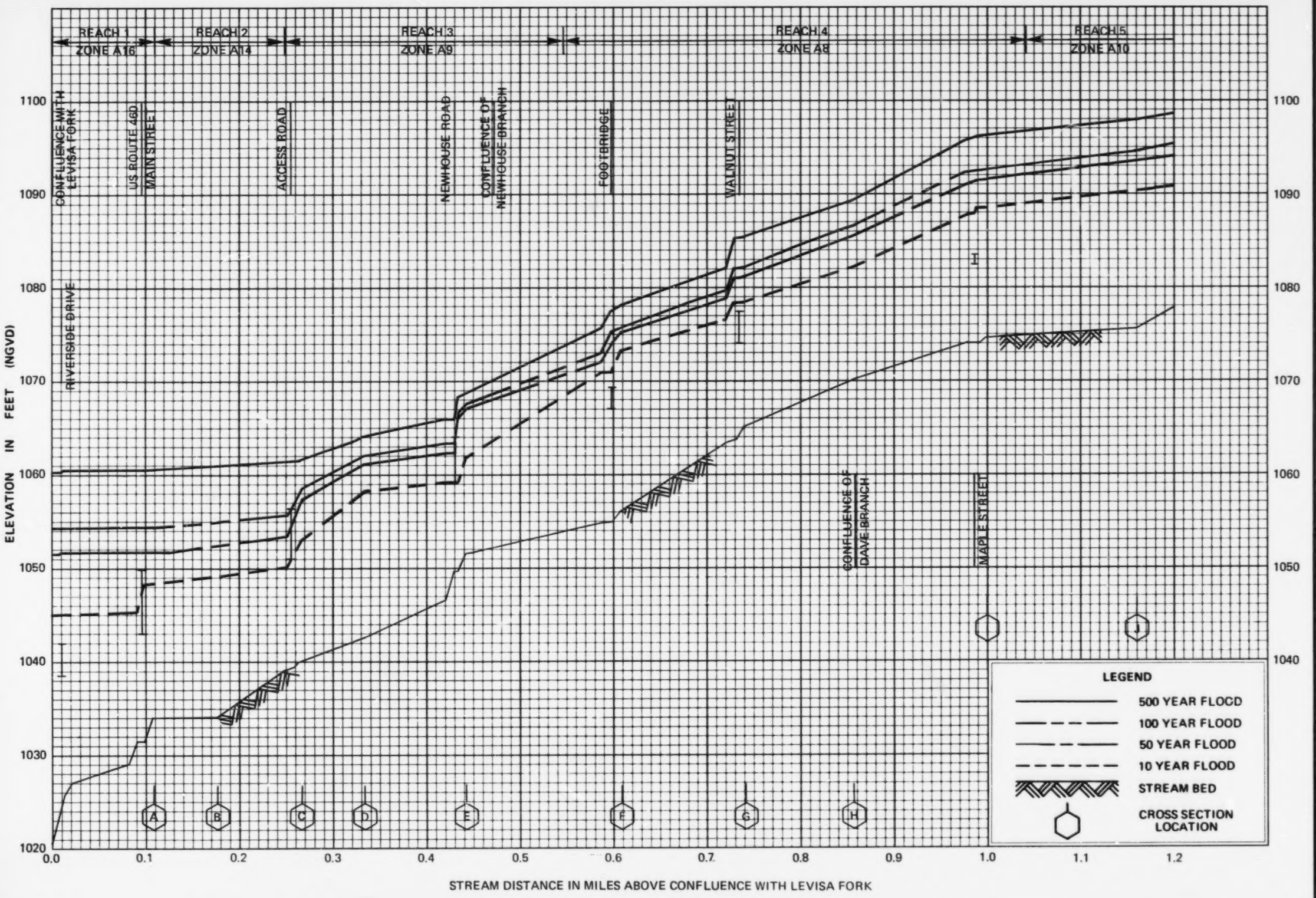

FLOOD PROFILES

SLATE CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

TOWN OF GRUNDY, VA
(BUCHANAN CO.)

03P

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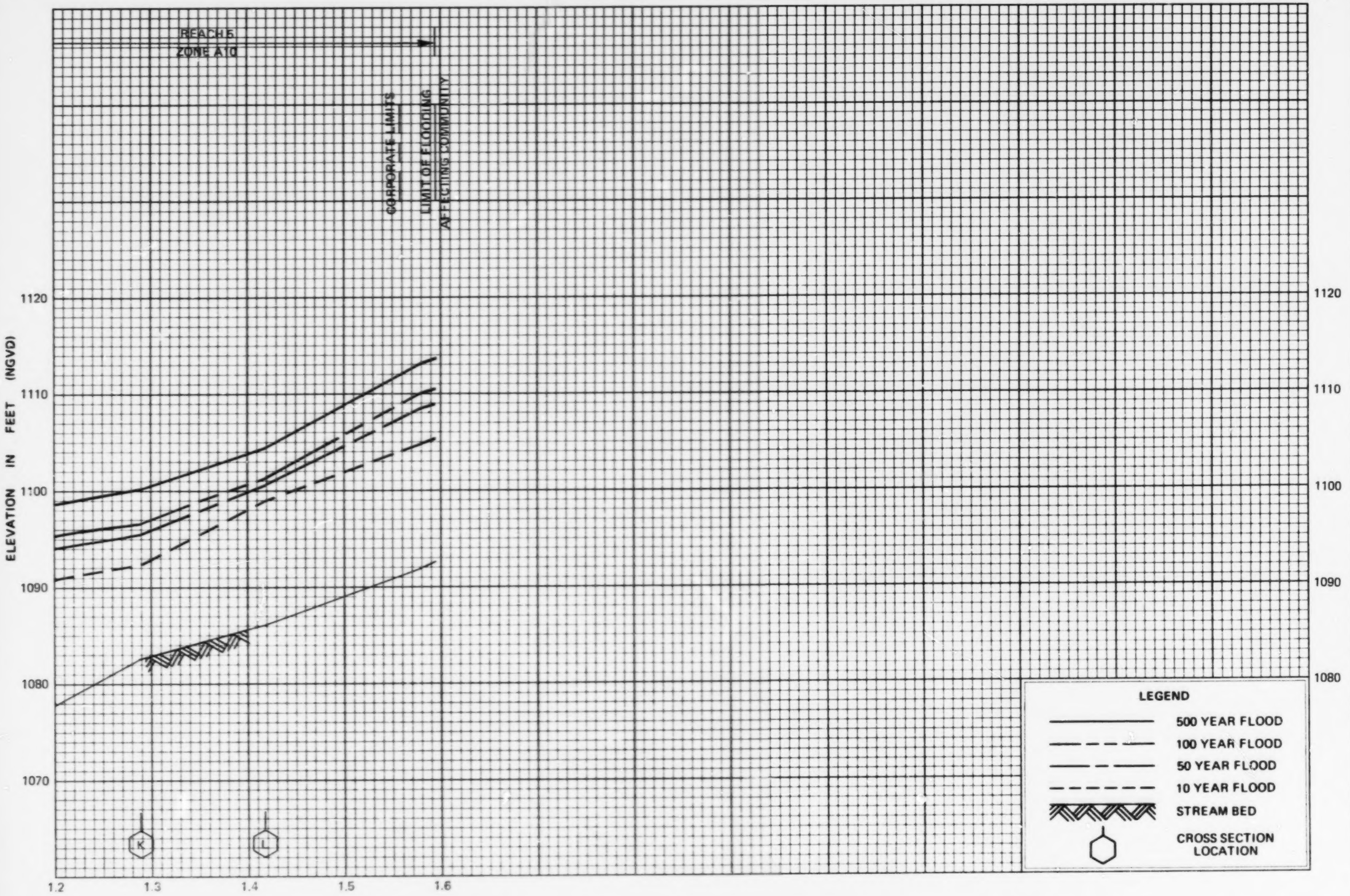

FLOOD PROFILES

SLATE CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

TOWN OF GRUNDY, VA
(BUCHANAN CO.)

04P

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